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Effect of Soil Mulching and Organic Fertilization on the Growth and Yield of Onions (*Allium cepa* L.) var: Texas Early Grano

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Abstract: Field experiment was carried out to study the effect of soil mulching and various types of organic fertilizers on the growth and yield of onions of Texas early grano. The experiment included two different factors, soil covers: black polyethylene, wicker and straw in sequentially (along with check The second factor was the organic fertilizing included, humic acid, poultry made-fertilizer, sheep fertilizer and cattle fertilizer) in sequence). The black polyethylene mulching resulted in a significant increase in the plant length and dry weight of the vegetative system, the plant yield and the total yield than in other mulches. The cows' fertilizer was significantly superior to all treatments in traits of plant length, dry weight of the shoot system, plant yield and total yield. The results of the interaction between the factors indicated that M1H4 significantly better in all parameters.

Keywords: Soil mulching, Organic fertilization, Onions

Onion (*Allium cepa* L.), which belongs to the Alliaceae garlic family, is one of the most important strategic crops in the world and is characterized by its nutritional, economic and medical value, as the onion contains good proportions of vitamins C, K, proteins, iron and calcium elements (AL-Abdaly et al 2018). Soil mulching plays a positive role in irrigation water and reducing losses of nutrients due to abundant irrigation leaching (Gordon et al 2010), and also preserve the physical properties of the soil (Iqbbal et al 2009). Mulching the soil with plastic increases the production and quality of many vegetable crops and preserves irrigation water, especially when using the drip irrigation system. Industrial mulching reduce the problems of harmful weeds and some insect pests (Ngouajio et al 2008) and maintain soil moisture and increasing crop yield through more efficient use of soil nutrients. The industrial polyethylene mulching are faulted because they do not allow evaporation of water, which increases the moisture of the soil near the plant, and provides an environment suitable for the growth of fungi that cause plant rot. Texas early grano onion is distinguished by the fact that the bulb is formed on the surface of the soil, which increases its risk of mechanical damage, and the exposure to direct sunlight, which increases the possibility of sun scald that results in great damage and loss in the yield and the decrease of storage susceptibility to the bulbs. The role of the mulch in raising the temperature of the micro-climate of the plant, which encourages the growth of bulbs, and increase yield quantity (Brewster 2008). To improve the response and enhance the effect of organic fertilizers, the method of mulching the soil depends on providing an environment that makes use of it and as a pathway that expands the response. Organic onions covered with black plastic showed that it contains a high percentage of nitrogen and oral yield compared to their cultivation without mulch. Sarkar (2019) observed that different types of polyethylene improved the soil content of nitrogen, phosphorous and potassium elements. The harmful effects of chemical fertilizers are among the most important reasons that urged agricultural specialists to search for organic alternatives that have fewer effects and safe for human health. Humic acid comes at the forefront of these fertilizers resulting from the decomposition of organic matter (Billingham 2015). Several studies have been conducted on the possibility of using different types of organic fertilizers to improve growth and increase the harvest in onions. The present study aims to examine the effect of soil mulch and the addition of organic fertilizers on the growth and yield of onions, Texas early grano class.

MATERIAL AND METHODS

The field experiment was carried at University of Anbar in 2019 with random complete block design with three replicates. The field was divided into terraces, the area of each one is 1.6 sq m, with one terrace for each experimental unit, in which four lines are planted, the distance between one plant and another 10 cm, between one line and another 20 cm, and 20 plants per line. The drip irrigation system was used. The experiment included two factors: the first (mulching) without mulching, black polyethylene mulch,